

REMARKS / DISCUSSION OF ISSUES

The present amendment is submitted in response to the Office Action mailed August 4, 2009. In view of the amendments above and the remarks to follow, reconsideration and allowance of this application are respectfully requested.

Status of Claims

Claims 1-28 are pending in the application. Claims 1-2, 3-28 were amended. The claims in general are amended for one or more non-statutory reasons, for example to remove figure label numbers and/or replace European claim phraseology with U.S. claim language having the same meaning.

Allowable Subject Matter

Applicant wishes to thank the Examiner for indicating that Claim 27 is allowed and that Claims 21, 24, 25 and 28 are allowed if they overcome the double patenting rejections set forth in the Office Action. Applicant also wishes to thank the Examiner for indicating that Claims 22 and 23 would be allowable if rewritten to overcome the rejections under 35 U.S.C. 112, 2nd paragraph, set forth in the Office Action. Applicants also wish to thank the Examiner for indicating that Claims 12-14 are objected to as being depended upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants have previously rewritten dependent Claim 12 in independent form including all of the limitations of independent Claim 1 (see previously presented Claim 28). Hence, it is believed that Claim 28 is in condition for allowance.

Terminal Disclaimer

In response to the terminal disclaimer being filed to overcome the provisional rejections of double patenting, it is noted that an attorney or agent, not of record, is not authorized to sign a terminal disclaimer in the capacity as an attorney or agent acting in a representative capacity as provided by 37 C.F.R. 1.34(a). In response, Applicants respectfully note that the present application is linked to customer number 24737, which includes the

name of all of the attorneys, including Mr. Michael Belk who signed the terminal disclaimer. Accordingly, it is respectfully requested that the rejection on the grounds of non-statutory obviousness-type double patenting of Claims 1, 2, 3, 4-18, 19-20 and 21-26 be withdrawn, and that all claims be allowed.

Rejections under 35 U.S.C. §103(a)

In the Office Action, Claims 1-8, 15-16 and 19-20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over W002/099527 (“Prins”) in view of U.S. Patent No. 4,701,021 (“Le Pesant”). Applicant respectfully traverses the rejections.

Claims 1-8, 15-16 and 19-20 are allowable

The cited portions of Prins and Le Pesant, individually or in combination, fail to disclose or suggest the specific combination of claim 1. For example, the cited portions of Le Pesant fail to disclose or suggest, “*wherein in a first mode, the electrically conductive liquid fills the chamber inside the optically active portion, and wherein in a second mode, the electrically conductive liquid fills the chamber outside of the optically active portion*”, as recited in claim 1 (Emphasis Added).

The Office states that Prins et al. does not expressly disclose the arrangement where the beam of radiation passes through the switchable optical unit and that the electrically conductive liquid fills the chamber inside the optically active portion and fills the chamber outside of the optically active portion. The Office further states that it would have been obvious to one of ordinary skill in the art to: arrange the optical switchable unit being configured so that where the beam of radiation passes through the switchable optical unit and that the electrically conductive liquid fills the chamber inside the optically active portion and fills the chamber outside of the optically active portion, as taught by Le Pesant.

Applicants respectfully submit that the Office is in error regarding their conclusion of obviousness. In contrast to claim 1, Le Pesant teaches the use of non-electrically conductive liquids (e.g., hydrocarbons) in accordance with a method that does not operate according to the electro-wetting principle. That is, Le Pesant does not teach the use of an electrically

conductive liquid. Therefore, Le Pesant cannot teach “*wherein in a first mode, the electrically conductive liquid fills the chamber inside the optically active portion, and wherein in a second mode, the electrically conductive liquid fills the chamber outside of the optically active portion*”, as recited in claim 1 (Emphasis Added).

In contrast to Le Pesant, the compact switchable optical unit of the invention operates in accordance with the electro-wetting principle that requires use of **electrically conductive liquids**. The method, briefly stated, is as follows. In operation, when a second output of a voltage source is connected to the at least one first electrode, a **conductive liquid** is **attracted by the at least one first electrode, in accordance with the electro-wetting principle**, so that the liquid is positioned in the optically active portion of the device. In the case where the liquid chamber is arranged between refractive surfaces of a lens system, the unit then has a first optical power, which is determined by the refractive index of the **conductive liquid** and the curvature of the lens surfaces. When a second output of the voltage source is connected to second electrode means, the **conductive liquid** is **attracted by the second electrode means** so that the conductive liquid is positioned outside the optically active portion. The device then has a second optical power, which is determined by the refractive index of a medium that has replaced the polar liquid. It should be emphasized that the method of the invention, as described, **does not work with insulating liquids**, such as those taught in Le Pesant because an insulating liquid will not produce the necessary electro-wetting effect.

In contrast to the invention, the optical modulator of Le Pesant **does not** operate in accordance with the electro-wetting principle. That is, Le Pesant **does not** teach or suggest the use of **an electrically conductive liquid** that fills the chamber inside the optically active portion and fills the chamber outside of the optically active portion. It is well known that electro-wetting involves modifying the surface tension on a solid surface using a voltage. By applying a voltage, the wetting properties of a hydrophobic surface can be modified and the surface becomes increasingly hydrophilic (wetable). The electrowetting effect has been defined as “the change in solid electrolyte contact angle due to an applied potential difference between the solid and the electrolyte”. The phenomenon of electrowetting can be understood in terms of the forces that result from the applied electric field

Instead, the optical modulator of Le Pesant utilizes insulating liquids that do not operate in accordance with the electro-wetting principle. Le Pesant discloses an optical modulator for a light beam using the electrically controlled fluid displacement cells constituted by two parallel transparent plates, defining a capillary space connected to a reservoir containing at least one fluid, as well as to devices for applying electrical fields making it possible to control the displacement of the liquid between the reservoir and the capillary space, comprising at least one cell of a first type, whose transparent plates are positioned perpendicular to the direction of the beam, the capillary space being in the section of the beam and the fluid f2 of the cell being absorbent. See Le Pesant, col. 1, lines 60-67 through col. 2, lines 1-3.

Applicants respectfully submit that the optical modulator of Le Pesant employing two parallel transparent plates defining a capillary space and devices for applying electrical fields to control the displacement of an insulating liquid between a reservoir and the capillary space **is different** from the electro-wetting principle for causing an electrically conductive liquid to fill the chamber inside the optically active portion and fill the chamber outside of the optically active portion, as claimed in claim 1.

It is particularly emphasized that the insulating liquids used by Le Pesant are different from the electrically conductive liquids of the invention. Specifically, Le Pesant teaches that Fluids 1f2 and 2f2 are chosen so that their permittivity differs from that of fluid f₁, which can be air. Moreover, it is advantageous for the liquid to be displaced to be slightly corrosive and only have a limited electrical conductivity. Le Pesant further discloses that the fluid f2 can be chosen from among the hydrocarbons, such as alkanes, containing 5 to 25 carbon atoms, ketones (acetone, cyclohexanone, methyl ethyl ketone) or nitro derivatives (nitrobenzene, nitrotoluene). See Le Pesant, col. 2, lines 45-50. Applicants note that hydrocarbons are by definition insulating. In fact, U.S. Patent 4,681,980 is directed to a method for improving the electrical characteristics of an electrical insulating hydrocarbon suitable for use in oil-filled electrical appliances.

Further, if the method of Le Pesant were substituted into the arrangement of Prins, the result would be impracticable. That is, the capacitive arrangement i.e., non-electrowetting approach, of Le Pesant would require thousands of volts to fill the hollow chamber of Prins. This is due to the voltage having to be applied over the entire cavity. In contrast, the invention only requires a small voltage, on the order of 10V, because it is only applied over a thin insulator, which is independent of the cavity dimensions. The method of Le Pesant is only operative for the described arrangement of two parallel plates that are very closely separated, e.g., on the order of 10 micrometers. It should be understood that this is insufficient to make switchable lenses.

Thus, the cited portions of Prins and Le Pesant, individually or in combination, do not disclose or suggest, “*wherein in a first mode, the electrically conductive liquid fills the chamber inside the optically active portion, and wherein in a second mode, the electrically conductive liquid fills the chamber outside of the optically active portion*”, as recited in claim 1 (Emphasis Added). Hence claim 1 is allowable.

Claims 2-8, 15 and 19-20 depend from claim 1, and are therefore allowable at least by virtue of their dependence from allowable claim 1.

Claims 9-11 are allowable

The Office rejects Claims 9-11 as being unpatentable over Prins in view of W002/099527 (“Feenstra”). Applicants respectfully traverse the rejections.

As explained above, the cited portions of Prins do not disclose each and every element of claim 1, from which claims 9-11 depend. Fenstra does not disclose each of the elements of claim 1, from which claims 9-11 depend. For example, Fenstra does not disclose or suggest “*wherein in a first mode, the electrically conductive liquid fills the chamber inside the optically active portion, and wherein in a second mode, the electrically conductive liquid fills the chamber outside of the optically active portion*”, as recited in claim 1. Therefore, claim 1 is allowable over the asserted combination of Prins and Fenstra, and claims 9-11 are allowable, at least by virtue of their dependence from claim 1.

Claims 17 and 18 are allowable

The Office rejects Claim 17 and 18 as being unpatentable over Prins in combination with Le Pesant and further in view of U.S. Patent Application No. 2002/0176148 ("Onuki").

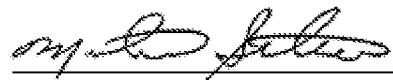
As explained above, the cited portions of Prins and Fenstra, alone and in any reasonable combination, do not disclose each and every element of claim 1, from which claims 17 and 18 depend. Onuki does not disclose each of the elements of claim 1, from which claims 17 and 18 depend. For example, Onuki does not disclose or suggest "*wherein in a first mode, the electrically conductive liquid fills the chamber inside the optically active portion, and wherein in a second mode, the electrically conductive liquid fills the chamber outside of the optically active portion*", as recited in claim 1. Rather, Onuki discloses a controllable lens system in a camera/hand-held device having a switchable optical unit. Therefore, claim 1 is allowable over the asserted combination of Prins, Fenstra and Onuki, and claims 17 and 18 are allowable, at least by virtue of their dependence from claim 1.

Conclusion

In view of the foregoing amendments and remarks, it is respectfully submitted that all claims presently pending in the application, namely, Claims 1-28 are believed to be in condition for allowance and patentably distinguishable over the art of record.

If the Examiner should have any questions concerning this communication or feels that an interview would be helpful, the Examiner is requested to call Mike Belk, Esq., Intellectual Property Counsel, Philips Electronics North America, at 914-945-6000.

Respectfully submitted,



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